

## CORRIGENDA.

MONTHLY WEATHER REVIEW for December, 1905, Vol. XXXIII, No. 12, page 526, first column, line 25, omit "Silver thaw"; line 27, read "Glazed frost, or Silver thaw". Also same page, second column, line 17, omit "or silver thaw"; line 23, after "Glazed frost" insert "or silver thaw".

MONTHLY WEATHER REVIEW for April, 1906, Vol. XXXIV, No. 4, page 171, second column, line 25, for "a similar applications", read "a similar application".

MONTHLY WEATHER REVIEW for May, 1906, Vol. XXXIV, No. 5, page 214, first column, line 39, for "and very feeble", read "under very feeble".

MONTHLY WEATHER REVIEW for June, 1906, Vol. XXXIV, No. 6, page 267, second column, in left-hand column of Table 20

(Height in meters), for "7500" read "7000"; also same page, second column, line 9 from bottom, for "n" read "a". Page 269, second column, in left-hand column of Table 36 (Height in meters), for "6008" read "6000". Page 270, first column, in left-hand column of right-hand division of Table 39 ( $B-B_0$ , N.), line for 8000, for "-076" read "-0.6". Page 280, first column, under title "The Energy of a Storm", for "T. D. Smith, M. D." read "D. T. Smith, M. D."

MONTHLY WEATHER REVIEW for July, 1906, Vol. XXXIV, No. 7, page 315, second column, line 12 from bottom, for "Sierra de Luquillo" read "Sierra de Luquillo". Page 320, Table 15, title: add the words "available to the author in 1904", after the word "records". In the table itself omit the data given for Canóvanas, Perla, and San Juan, and refer to tables 10, 13, and 9, respectively.

## FORECASTS AND WARNINGS.

By Prof. E. B. GARRIOTT, in charge of Forecast Division.

Two well-defined and energetic storms appeared in the middle and northern latitudes of the North Atlantic Ocean during September, 1906. The first of these was a West Indian disturbance that is described elsewhere in this number of the MONTHLY WEATHER REVIEW. This disturbance past west and north of Bermuda during the night of the 8-9th, set in over the British Isles on the 13th, and moved thence over Northwestern Europe. The second ocean disturbance of consequence appeared over the Azores September 30 and moved thence northeastward to the British Isles by October 2. Advices were cabled to Lloyds, London, in connection with these storms. The advice dated the morning of September 8 stated that a severe storm would move northeastward from Bermuda, and that of September 30 that a severe storm south of the Azores would probably move northeastward. Aside from dates of the passage of the storms referred to, barometric pressure was notably and persistently high over the middle and eastern portions of the North Atlantic.

In the United States the first decade of September was warm and dry, except in portions of the Southern States and on the north Pacific coast, where heavy rain occurred. A barometric disturbance that appeared on the north Pacific coast on the 5th was attended during the 5th and 6th by the first gale of the fall season. The second north Pacific coast storm prevailed from the 12th to 15th, and the third from the 22d to 24th. On the 23d the first rain of the season fell in the bay counties of California. Attending the eastward and southeastward progress of an area of high barometer that appeared on the extreme north Pacific coast on the 25th, low temperatures and frost were experienced in northern Iowa, northern Nebraska, and southern South Dakota on the morning of the 27th. Attending a second area of high barometer that appeared on the north Pacific coast on the 28th, killing frost occurred in North Dakota on the 29th, and on the 30th frost was reported from the States of the lower Missouri Valley over the upper Lake region, and a minimum temperature of  $18^{\circ}$  was noted at White River, Ont. The only conspicuously severe and destructive storm of the month in the United States was the disturbance that advanced from the western Caribbean Sea northward over the Gulf of Mexico during the third decade of the month. This storm is described under "The West Indian Hurricanes of September, 1906".

## BOSTON FORECAST DISTRICT.

The month, as a whole, was warm and dry, and in many sections, particularly in Maine and New Hampshire, low water in streams, springs, and ponds occasioned much inconvenience to milling and other interests. The highest temperatures of the month were noted generally on the 19th and the lowest on the 25th, light to killing frosts being reported in many sections on the latter date. No heavy windstorms occurred on the coast and shipping suffered little delay on account of

weather conditions. Frost warnings were issued to cranberry growers on the 24th, and moderate to killing frosts, with temperature  $4^{\circ}$  to  $6^{\circ}$  below freezing, occurred in that region on the morning of the 25th. The warnings were of much value to the cranberry interests. No storms or frost occurred without warnings.—*J. W. Smith, District Forecaster.*

## NEW ORLEANS FORECAST DISTRICT.

Weather conditions were moderate, except during the period of the tropical storm that past inland between New Orleans and Mobile on the 26th. Warnings were issued well in advance of this storm, were widely distributed, and precautions were taken to prevent the loss of life and property. (See special report in this number of the REVIEW.) There was no loss of life in this section, and the loss of property was very small when the severity of the storm is considered. Frost warnings were issued for Oklahoma, Okla., and Bentonville, Ark., on the 30th.—*I. M. Cline, District Forecaster.*

## LOUISVILLE FORECAST DISTRICT.

The month was one of the wettest Septembers on record, both as regards the great number of rainy days and the remarkably heavy rainfalls that occurred thruout Kentucky and Tennessee. General conditions were sluggish until the 12th when a disturbance moved rapidly across the upper central valleys and the Lake region, closely followed by a strong high barometer area which from the 14th to 17th gave the only clear period of the month. The tropical storm that moved slowly up the Mississippi Valley from the 27th to the 29th gave high winds and heavy rains, but caused no damage of consequence.—*F. J. Walz, District Forecaster.*

## CHICAGO FORECAST DISTRICT.

There were no storms of consequence until the 28th when a tropical disturbance caused a severe northeast rainstorm to set in over the upper Mississippi Valley and the southern portion of the upper Lake region. Storm warnings were ordered for Lakes Michigan and Huron, but the increase in the intensity of an area of high barometer in the northwest prevented the northward movement of the storm, and the high winds, which did not set in until the morning of the 29th, were confined to the southern portions of the lakes mentioned. Frost warnings on the 29th and 30th for the upper Lake region, the Missouri and upper Mississippi valleys were followed by general frosts, which were heavy or killing in places. Frost warnings on the 26th for portions of Wisconsin, Minnesota, Iowa, and Nebraska were partly verified.—*H. C. Frankenfield, Professor and District Forecaster.*

## DENVER FORECAST DISTRICT.

The month was drier than usual except in northern Utah and on the middle eastern slope of the Rocky Mountains. At several stations in southeastern Colorado the rainfall was the greatest on record for September. While the month was generally cooler than usual there was an absence of cold periods,

and killing frosts were confined to high level stations; they were accurately forecast, as were most of the light frosts reported.—*F. H. Brandenburg, District Forecaster.*

#### SAN FRANCISCO FORECAST DISTRICT.

There were moderate rains of the sonora type in the Colorado Valley section on the 14th, 15th, and 16th, and thunderstorms in the extreme southern portion of the State on the 15th. On the 23d a moderate disturbance moved rapidly southward along the coast, and showers occurred from San Francisco northward. Some high winds were reported in the San Joaquin Valley and Nevada with the passage of this disturbance. The month closed with extremely warm weather in the vicinity of Los Angeles.—*A. G. McAdie, Professor and District Forecaster.*

#### PORTLAND, OREG., FORECAST DISTRICT.

As a rule the storms of the month past too far north to cause severe weather in the north Pacific coast States. Rainfall was heaviest—one to two inches above the normal amount—in western Washington and slightly below normal elsewhere. Temperature averaged from one to nearly four degrees above normal. There were two stormy periods, 6th to 8th and 12th to 14th. The maximum wind during the first period was 72 miles an hour from the southeast at North Head and during the second period 64 miles from the southeast at the same station. Light frosts were general the mornings of the 11th and 26th, and they occurred in scattered places on other dates. Timely warnings were issued for all storms and frosts and no casualties or damage of note is known to have occurred.—*E. A. Beals, District Forecaster.*

### RIVERS AND FLOODS.

There were but few stations where flood stages were recorded during the month, and these were in the southeastern and central Gulf States.

The highest water in the rivers of North Carolina and South Carolina was the result of the heavy rains of the preceding month, altho high water occurred from the 15th to the 20th in these rivers.

During the last few days of the month the heavy rains over the middle Gulf States caused the rivers of that section to rise rapidly. With the exception of the Black Warrior River, flood stages were not reached. In some instances the highest readings were caused by the high wind backing the water upstream. Warnings were issued for the high water in all cases except in the Meridian and Mobile districts where the loss of communication prevented the distribution.

On September 24 the steamer *Lora*, laden with freight from St. Louis, Mo., docked at the wharf in Kansas City, Mo. This event marks the renewal of traffic on the Missouri River, after the lapse of more than a decade.

The highest and lowest water, mean stage, and monthly range at 270 river stations are given in Table VI. Hydrographs for typical points on seven principal rivers are shown on Chart I. The stations selected for charting are Keokuk, St. Louis, Memphis, Vicksburg, and New Orleans, on the Mississippi; Cincinnati and Cairo, on the Ohio; Nashville, on the Cumberland; Johnsonville, on the Tennessee; Kansas City, on the Missouri; Little Rock, on the Arkansas; and Shreveport, on the Red.

## THE WEATHER OF THE MONTH.

By Mr. P. C. DAY, Assistant Chief, Division of Meteorological Records.

### PRESSURE.

The distribution of mean atmospheric pressure for September over the United States and Canada is graphically shown on Chart VI, and the average values and departures from the normal are shown for each station in Tables I and V.

Pressure was high over the entire central portion of the country from the Atlantic to the Pacific, with the crest over the Appalachian region, and diminished rapidly north and south.

The high area over the Ohio Valley and Middle Atlantic States was more pronounced than usual, and extended well into the lower Lake region and New England. On account of the rather persistent presence of high pressure areas over the central sections of the country, the low areas that crost from the Pacific, or that formed on the Rocky Mountain slope, pursued courses well to the north and were not accompanied by severe weather of any description. The barometer averaged unusually low over the lower Mississippi Valley, owing to the passage over that section of the severe and destructive hurricane from the 26th to the 27th and the stormy conditions that prevailed for several days thereafter.

Pressure was also lower than the average over the entire northern border from the Great Lakes to the Pacific and over New England and the Maritime Provinces of Canada.

Under the influence of the high pressure over the Ohio Valley and Lake region the surface winds over the Mississippi Valley and the Great Plains were generally from an easterly quarter, while over New England and along the northern border as far west as the the Rocky Mountains they were from the south.

### TEMPERATURE.

The month was one of unusual warmth, altho no extended periods of excessive heat occurred. Over all sections of the United States, except the southern Rocky Mountain and Plateau region, and extending into the Canadian Provinces as far north as observations extend, the temperature averaged

well above the normal. Over the Missouri, upper Mississippi and Ohio valleys, and the Lake region the daily average was from 4° to 6° above the normal. The monthly mean temperature was slightly below the average in Nevada, Utah, western Colorado, northwestern Arizona, and southeastern California.

While warm weather was the rule, the daytime temperatures were not excessive, and maximum readings of 100°, or above, were recorded in small areas only. In the upper Missouri Valley temperatures of 100°, or above, were recorded from the 7th to the 9th and unusually high temperatures prevailed over southern California during the closing days of the month. Temperatures below the freezing point were recorded over small sections during the latter part of the month, but over the greater part of the country, including the corn-belt, vegetation was untouched by frost at the end of the month.

### PRECIPITATION.

The precipitation was generally ample in all sections of the interior from the Rocky Mountains eastward. Over Nebraska, Colorado, western Kansas, and surrounding districts the precipitation was abnormally heavy for September, which is usually a month of light rainfall.

At Dodge, Kans., the fall for the month, 9.26 inches, was twice the amount recorded in any previous September during the past thirty years. The month was also one of heavy precipitation over the lower Mississippi Valley and east Gulf States. The larger portion of the precipitation over this region occurred, however, during the last few days of the month, attending the passage of the severe tropical storm of the 26th and 27th over that section. Much damage was done by the latter storm from wind and high water, a full account of which will be found in another portion of this Review. The rainy season on the north Pacific coast began early in the month, and amounts far in excess of the average were recorded over the western sections of both Washington and Oregon.

Along the entire Atlantic coast from Maine to Florida the